



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/865,877	05/25/2001	Roy Daron Cideciyan	ROC920010065US1	5119

7590 04/05/2005

Joan Pennington
535 North Michigan Ave
Unit 1804
Chicago, IL 60611

EXAMINER

ZHENG, EVA Y

ART UNIT	PAPER NUMBER
----------	--------------

2634

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/865,877	Applicant(s) CIDECIYAN ET AL.	
	Examiner Eva Yi Zheng	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-16 and 18-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-7, 14-16 and 18-20 is/are rejected.
- 7) ☒ Claim(s) 8-13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 2-16 and 18-20 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

2. Claim 21 is objected to because of the following informalities: on line 4, recitation: "where" should be changed to --wherein--.
Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 6 and 18-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claims 6 and 18, recitation: "even length magnets" is not well known or a common term/phrase in the art. Therefore it requires further description and clear definition.

Art Unit: 2634

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 18, lines 5-8 are confusing and unclear of what is included for the step of generating predefined word synchronization pattern and what is included for even length magnets. Is it the readback signal or predefined word synchronization pattern?

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 2-6, 14-16 and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Dolivo et al (US 5,260,976).

- a) Regarding claim 2, Dolivo et al disclose apparatus for word synchronization with large coding distance and fault tolerance for a partial-response maximum-likelihood (PRML) data channel in a direct access storage device (DASD) comprising:

a Viterbi detector (19 in Fig. 1B) for receiving equalized PR4 samples (Col 3, L63 and Col 4, L17) including a predefined word synchronization pattern (z(t)); said Viterbi

Art Unit: 2634

detector being optimized for said predefined word synchronization pattern; said Viterbi detector including

- a two-state Viterbi trellis (Fig. 3; Col 4, L59-60);

- a word synchronization detector (21 in Fig. 1B) for said two-state Viterbi trellis;

and said two-state Viterbi trellis and said word synchronization detector are operated on a $2T$ basis, where $1/T$ is the sample rate (Col 4, L3-18 and L51-65).

b) Regarding claim 6, Dolivo et al disclose apparatus for word synchronization with large coding distance and fault tolerance for a partial-response maximum-likelihood (PRML) data channel in a direct access storage device (DASD) comprising:

- a Viterbi detector (19 in Fig. 1B) for receiving equalized PR4 samples (Col 3, L63 and Col 4, L17) including a predefined word synchronization pattern ($z(t)$); said predefined word synchronization pattern includes only even length magnets (Col 4, L51-56 and Col 5, L45-60); said Viterbi detector being optimized for said predefined word synchronization pattern; said Viterbi detector including

- a two-state Viterbi trellis (Fig. 3; Col 4, L59-60); and

- a word synchronization detector (21 in Fig. 1B) for said two-state Viterbi trellis.

c) Regarding claim 18, Dolivo et al disclose a method for word synchronization with large coding distance and fault tolerance for a partial-response maximum-likelihood (PRML) data channel in a direct access storage device (DASD) comprising the steps of:

- sensing a readback signal (Fig. 1B) including a predefined word synchronization pattern ($z(t)$) including the step of generating said predefined word synchronization

Art Unit: 2634

pattern including only even length magnets; said predefined word synchronization pattern including multiple pattern match sequences (Col 4, L 51-56 and Col 5, L45-60);

providing a dedicated Viterbi detector (19 in Fig. 1B) optimized for said predefined word synchronization pattern and said Viterbi detector including a two-state Viterbi trellis (Fig. 3; Col 4, L59-60) and a word synchronization detector (21 in Fig. 1B) for said two-state Viterbi trellis;

applying equalized PR4 samples from said readback signal including said predefined word synchronization pattern to said dedicated Viterbi detector (Col 4, L17-50);

detecting a predefined number of said multiple pattern match sequences of said predefined word synchronization pattern with said Viterbi detector (Col 5, L45-60; Table 2); and

generating a start of data trigger for the partial-response maximum-likelihood (PRML) data channel (Fig. 5; Col 12, L43- Col 13, L9).

d) Regarding claim 3, Dolivo et al disclose apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 2, wherein said predetermined word synchronization pattern included multiple pattern match sequences (as shown in Table 2).

e) Regarding claim 4, Dolivo et al disclose apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 2, wherein said predetermined word synchronization pattern included three pattern match sequences (as shown in Table 2).

Art Unit: 2634

- f) Regarding claim 5, Dolivo et al disclose apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 2, wherein said predetermined word synchronization pattern included a repetition code including pairs of zeros and pairs of ones (as shown in Table 2).
- g) Regarding claim 14, Dolivo et al disclose apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 2, wherein said word synchronization detector implements a difference metric of said two-state Viterbi trellis and includes a path memory providing detected output decisions a_{k-13}, a_{k-12} (as shown in Fig. 5; Col 12, L43- Col 13, L9).
- h) Regarding claim 15, Dolivo et al disclose apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 14 wherein said detected output decisions a_{k-13}, a_{k-12} of said path memory are compared by a predefined word synchronization pattern compare function with said predefined word synchronization pattern; said predefined word synchronization pattern including multiple pattern match sequences (as shown in Fig. 5; Col 12, L43- Col 13, L9).
- i) Regarding claim 16, Dolivo et al disclose apparatus for word synchronization with large coding distance and fault tolerance as recited in claim 14-15 wherein said predefined word synchronization pattern compare function identifies at least a predefined subset of said multiple pattern match sequences and generates a start of data trigger for the partial-response maximum-likelihood (PRML) data channel (as shown in Fig. 5; Col 12, L43- Col 13, L9).

Art Unit: 2634

j) Regarding claim 19, Dolivo et al disclose a method for word synchronization with large coding distance and fault tolerance for a partial-response maximum-likelihood (PRML) data channel as recited in claim 18 wherein the step of providing a dedicated Viterbi detector optimized for said predefined word synchronization pattern includes the step of optimizing said Viterbi detector by eliminating branches from said two-state Viterbi trellis, thereby increasing coding distance (as shown in Fig. 3 and 4).

k) Regarding claim 20, Dolivo et al disclose a method for word synchronization with large coding distance and fault tolerance for a partial-response maximum-likelihood (PRML) data channel as recited in claim 18 wherein said predefined word synchronization pattern includes three pattern match sequences and where the step of detecting said predefined number of said multiple pattern match sequences of said predefined word synchronization pattern with said Viterbi detector includes the step of detecting two of said three pattern match sequences of said predefined word synchronization pattern (as shown in Table 2).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dolivo et al (US 5,260,976).

Regarding claim 7, Dolivo et al disclose all the subject matters described above except for the specific teaching of a three-way multiplexer for the two-state Viterbi trellis.

However, Dolivo et al teaches two 2-way multipliexer in the error test device (44.0 and 44.2 in Fig. 6). Both Dolivo et al and current applicant construct logic circuits for receiving quantized 6 bits inputs samples and offset them for the purpose of detecting error for the two-state Viterbi trellis.

Therefore, it is obvious to one of ordinary skill in art to realize that the two 2-way multipliexer by Dolivo et al is equivalent and has the same functionality as a three-way multiplexer. By implement a three-way multiplexer in Dolivo et al will generate, compare and detect error signals in a two-state Viterbi trellis.

Allowable Subject Matter

11. Claims 8-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Yi Zheng whose telephone number is (571) 272-3049. The examiner can normally be reached on 7:30-4:30.

Art Unit: 2634

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-879-9306.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:


(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

March 31, 2005

Eva Yi Zheng
Examiner
Art Unit 2634



SHUWANG LIU
PRIMARY EXAMINER